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ARCHIVES OF PEDIATRICS

A MONTHLY DEVOTED TO THE

DISEASES OF INFANTS AND CHILDREN

JOHN FITCH LANDON, M.D., Editor

LEADING ARTICLES IN THIS NUMBER

Biological Changes Associated with Dyslexia.

George E. Park, M.D.; John F. Bimmerle, M.D.; Alfred Schmieding, LL.D.; Frank M. Lorimer, M.D.; Armin Grams, Ph.D.; Rosemary Taraitano, M.D. and Victor Krauss, Ph.D. 71

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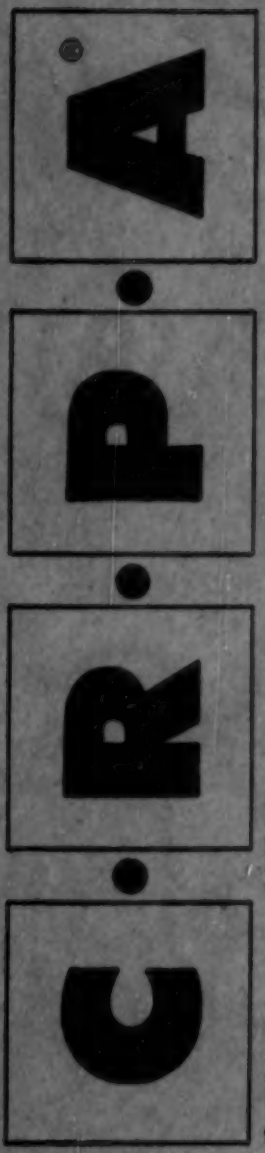

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3. Grayzel, H. G., Heimer, C. B., and Grayzel R. W.: New York St. J. M. 53:2233, 1953.
4. Heimer, C. B., Grayzel, H. G., and Kramer, B.: Archives of Pediatrics 68:382, 1951.
5. Behrman, H. T., Combes, F. C., Bobroff, A., and Leviticus, R.: Ind. Med. & Surg. 18:512, 1949.
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2. Curry, J. C. and Barber, F. W.: Bacteriological Proceedings, 1951, of The Society of Am. Bact., page 23.
3. Grossman, L., St. Francis Hospital, Miami Beach, Fla., to be published.
4. Niedelman, M. L., et al. Jrnl. Ped., 37:762, Nov., 1950.
5. Bleier, A. H., et al. Arch. Ped., 69:445, Nov., 1952.
6. Benson, R. A., et al. Jrnl. Ped., 31:369, Oct., 1947.
7. Ibid: Jrnl. Ped., 34:49, Jan., 1949.

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BIOLOGICAL CHANGES ASSOCIATED WITH DYSLEXIA*

GEORGE E. PARK, M.D.
Department of Ophthalmology,
AND
JOHN F. BIMMERLE, M.D.; ALFRED SCHMIEDING, LL.D.;
FRANK M. LORIMER, M.D.; ARMIN GRAMS, Ph.D.;
ROSEMARY TARSITANO, M.D.; VICTOR KRAUSE, Ph.D.
Dyslexia Memorial Institute,
Chicago.

Introduction. The purpose of this study is to present psychological data on 198 dyslexiac children and young adults, the results of medical laboratory examinations made by technicians at Wesley Memorial Hospital, and to determine their significance. Blood counts and basal metabolic rates were made on all the patients.

Definition. Dyslexia is a syndrome characterized by a decreased ability to learn to read properly, even though the intelligence may be normal or superior. This unusual condition is functional, and in a high percentage correctable in contra-distinction to alexia.

STUDY

This study was promoted because it was found that many dyslexiac children and adults live under a condition of stress or a tension state, manifest on psychological and psychiatric examinations. In recent years stress has been found to alter numerous tissues in the body as well as the blood. A related significant

*From the Department of Ophthalmology, Northwestern University Medical School, and Dyslexia Memorial Institute, Chicago, Ill.

fact is that four times as many boys as girls have dyslexia which suggests that an hormonal imbalance may be an associated factor.

BLOOD COUNT

It is obviously very difficult to evaluate the part played by nonspecific stress, hormonal imbalance, maturational processes, and other factors in manifold hematologic responses. Surveys by Shuey[1] and his associates have shown that laboratory reports can not be considered as precision procedures. In view of the quality and experience of the technicians who made the blood cell determinations, the probability of error in our investigation is nullified by the averages and calculated medians, especially in view of the large number of determinations. The blood cell determinations of the dyslexiacs were made over a period of years by different technicians. Our data are compared with standard values recently published[2].

METHOD

The erythrocyte count, the total leucocyte count, the ratio between neutrophils and lymphocytes, and the basal metabolic rate were studied. Mostly, the Wechsler Intelligence Scale for Children and the California and Progressive Achievement Test were administered in the psychological examinations. The age range of the subjects was from 7 to 22 years, with the average age of 10 years 10½ months. The distribution in the various ages and the average reading retardation for their chronological age were:

AGE	7	8	9	10	11	12
Number of patients	16	26	39	40	26	16
Degree of retardation	—.7;	—.9;	—1.0;	—1.8;	—2.5	—2.2;
AGE	13	14	15	16		17+
Number of patients	11	8	3	5		8
Degree of retardation	—3.3;	—4.8;	—4.0;	—3.9;		—4.9;

No case was included with a history of brain injury or with an intelligence quotient lower than 85—the average I.Q. was 105.

RESULTS

Chart 1 depicts the erythrocyte count of patients in this study and their relation to the standard values. No anemia was present. This fact, therefore, indicates that the techniques were correct as

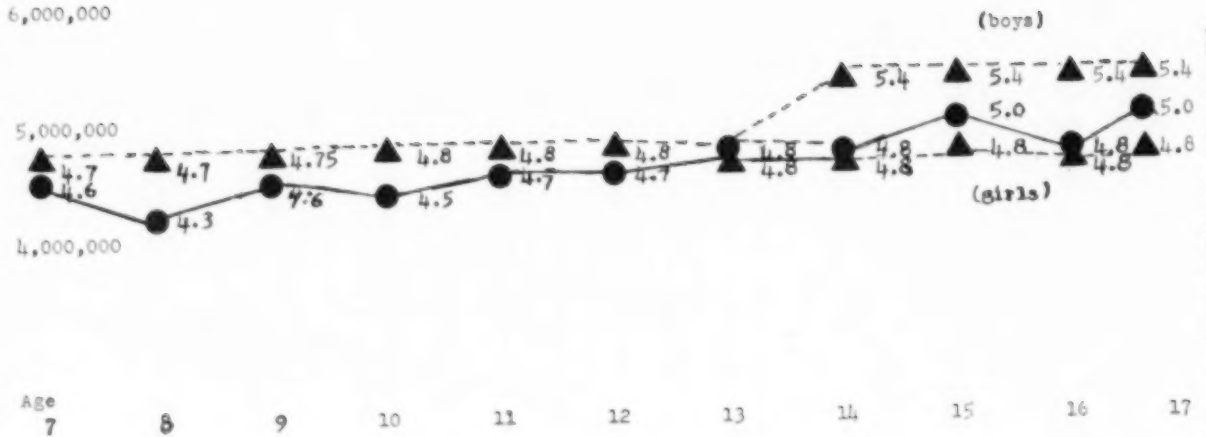

Chart 1. Erythrocyte Count. ▲= Albritton's Normal Value, ●= Dyslexia Values.

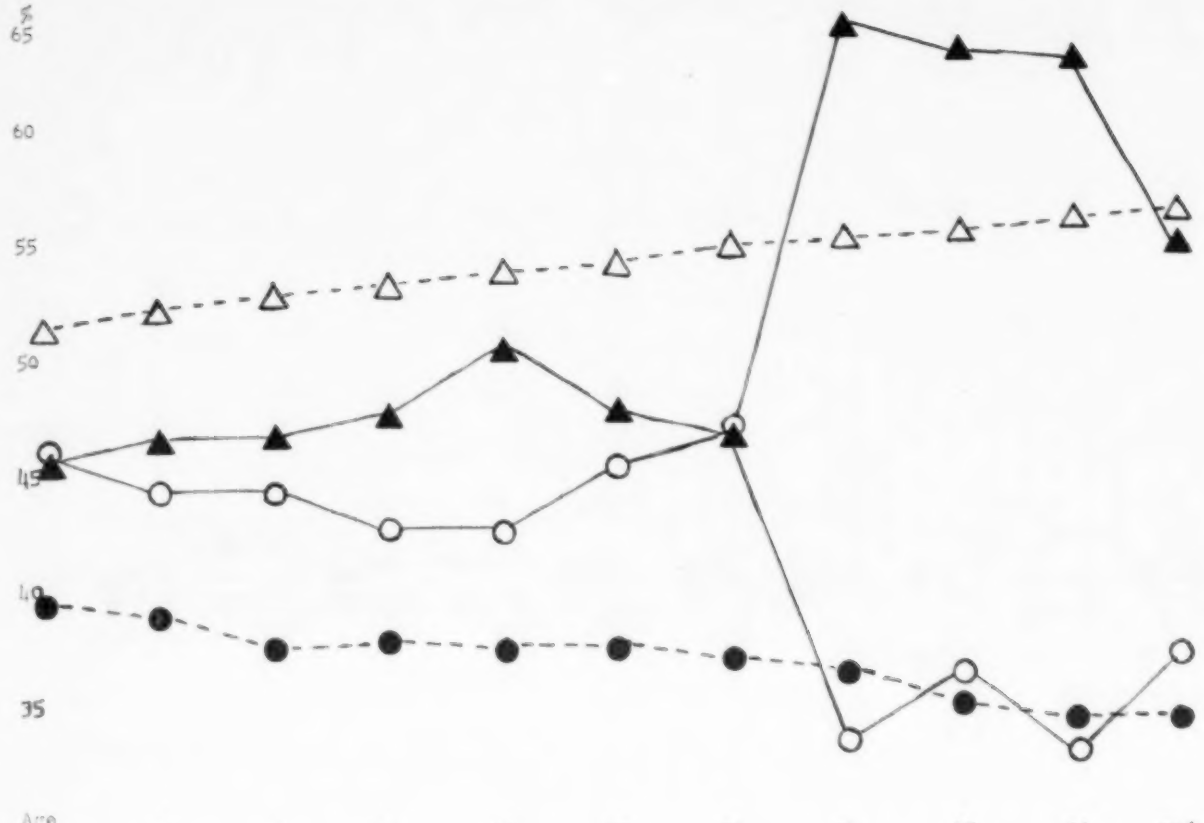

Chart 2. Percentage of Distribution of Neutrophils and Lymphocytes.
Albritton Standard Values. △=Neutrophils ●=Lymphocytes Dyslexiac Values. ▲= Neutrophils ○= Lymphocytes

used in the determination of the erythrocytes values of the dyslexiacs, for the slight variations are well within the limits of probable error.

Chart 2 is a graph of the percentages of differential leucocyte count of dyslexiac patients compared to standard values. It is evident that the ratios in the differential counts between the neutrophils and lymphocytes remained practically the same for six years in the dyslexiacs while during the subsequent years they paralleled and equaled the standard values. This was especially true of the lymphocytes. This fact further testifies in regard to the relative correctness of the technicians and the biological significance of the differences. And, again the question arises concerning the gonadal functions and their significance, as this adjustment occurs near the age of puberty.

The total number of circulating leucocytes and lymphocytes and neutrophils are shown in Charts 3 and 4. These data show that a leucopenia was present in the average dyslexia child. The 198 dyslexia cases had 1,376,300 white cells computed—the median was 6,400 per cubic millimeter. This shows a leucopenia 20 per cent below the standard values of 8,010 per cubic millimeter. Due to this leucopenia, there was an absolute decrease in the number of the total circulating neutrophils in addition to the disturbed ratio between these cells and the lymphocytes. The median value for circulating neutrophils as calculated by Albritton is 4,400 per cubic millimeter, while the median value for the dyslexiacs was 3,200, which shows a 27.7 per cent neutropenia. The standard median value for lymphocytes was 2,900 per cubic millimeter and the median for the dyslexiacs was 2,800, which indicates that the total number of circulating lymphocytes are practically equal in the standard and the dyslexiac groups.

It is evident that two factors in the blood counts, i.e., the erythrocytes and the circulating lymphocytes, are equal in the dyslexiacs and the standard values. Therefore, the biological significance of the leucopenia and neutropenia may assume an important role.

Charts 2 and 4 yield a slightly different result, but yet there is sufficient similarity to Chart 3 to indicate certain basic trends.

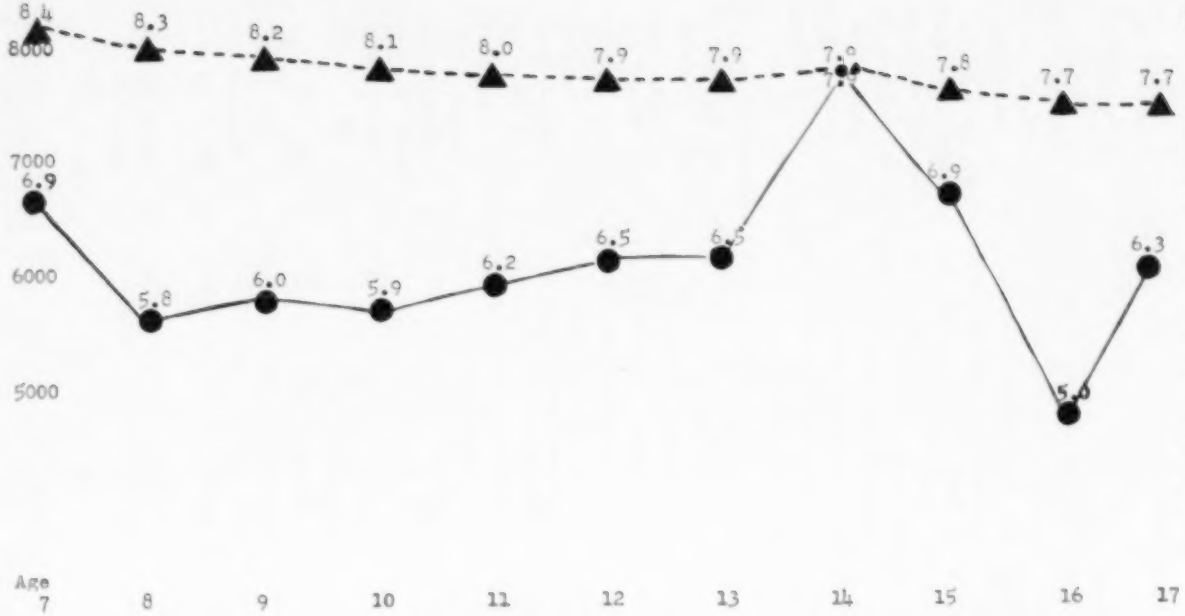

Chart 3. Total Leucocyte Count. ▲= Albritton Standard Values. Median 8.010 ●= Dyslexia Values. Median 6.400 Leucopenia 20 %

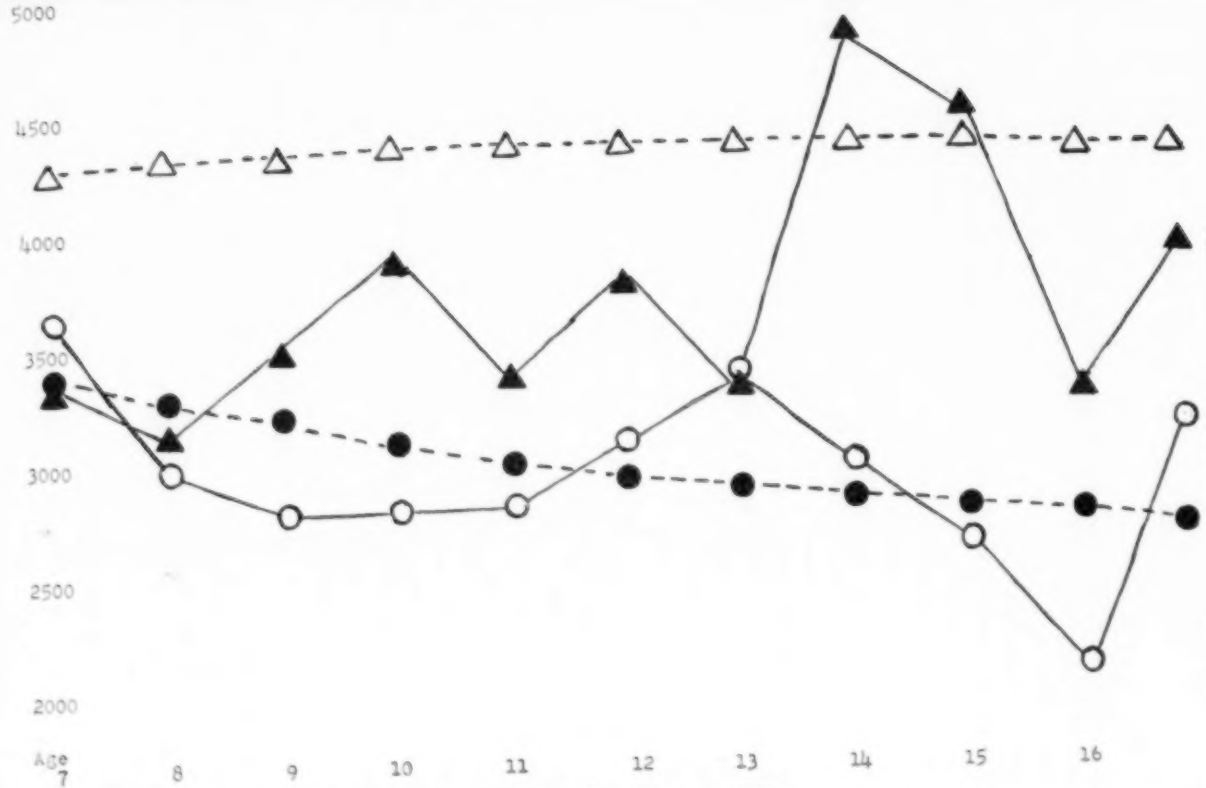

Chart 4. Number of Circulating Neutrophils and Lymphocytes

Albritton's Standard Values: △ = Neutrophils - Median 4,400
● = Lymphocytes - Median 2,900

Dyslexia Values: ▲ = Neutrophils - Median 3,200
○ = Lymphocytes - Median 2,800
Neutropenia 27.7%

BASAL METABOLIC RATE

The basal metabolic rate was determined in every case of dyslexia (Chart 5). If we consider from −10 to +10 as the normal range, we find that 37 per cent of the cases have a low basal metabolism. In a previous report on 215 cases of dyslexia, Park and Appleman[3] concluded that 27 per cent had symptoms indicating hypothyroidism which required and responded to therapy. The mere fact that a minus or plus metabolism was reported was not considered to indicate therapy unless there were other clinical symptoms. Should there be an artefact in the technique, such as apprehension on the child's part, or some other factor, the report would indicate an increase in the basal metabolic rate.

Due to the pronounced effects which corticoids exert upon the thyroid, stress may play an important part in the pathogenesis of both hypo- and hyperthyroidism. This is considered to be true of certain manifestations of thyroid disease, such as changes in the basal metabolic rate, serum cholesterol, iodine metabolism, exophthalmos, which are indubitably influenced by ACTH and corticoids[4].

Liddell[5], in his work with sheep and goats, concluded that the conditioned reflex described by Pavlov is not primarily an example of ordinary learning or a manifestation of intelligence. It is, instead, primarily a manifestation of the emotional context of behavior—an episode of emergency behavior bracketed between two primitive reactions, the vigilance reaction and the unconditional reaction to the reinforcement of the conditional stimulus. He was able to show that neurotic manifestations of neurotic sheep could be abolished completely by simply removing the thyroid gland. But the neurotic symptoms are fully reinstated if the thyroid hormone thyroxin is injected into the same sheep.

REVIEW OF SOME PERTINENT LITERATURE

The answers to many questions as to the nature of dyslexia may be found in the research which has been reported in recent years on the hypothalamus, pituitary, adrenal, excretion of 17 ketosteroids, glucose tolerance, spleen, thyroid, gonads, sodium and potassium levels and the response to various forms of stress, including the influence of heat and humidity.

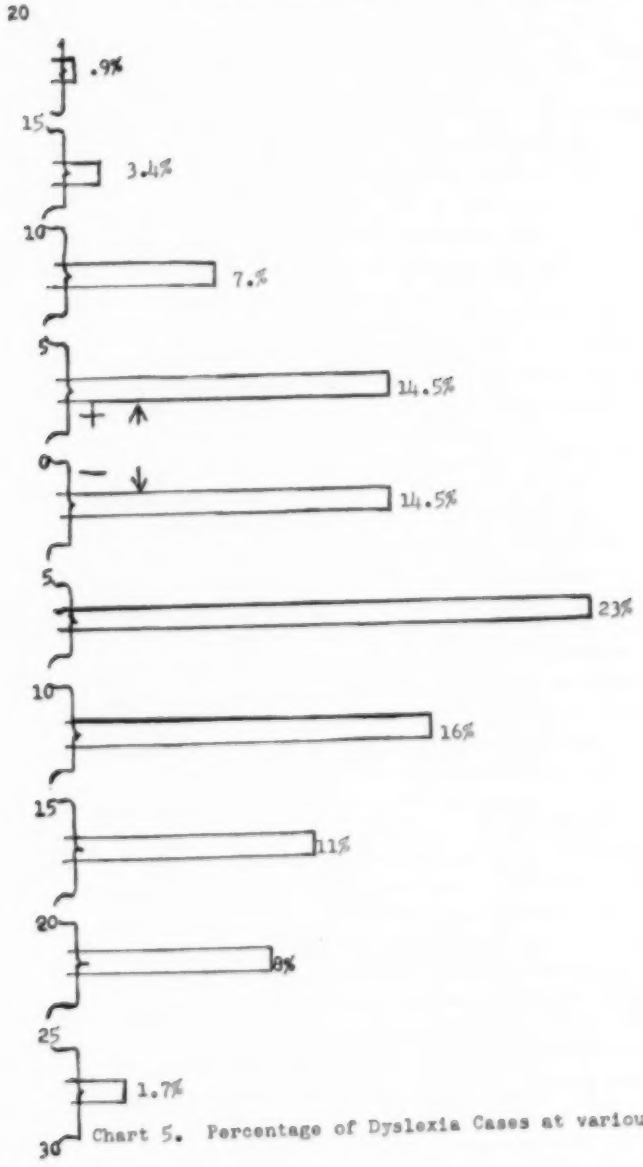

Chart 5. Percentage of Dyslexia Cases at various levels of B.M.R.

As this investigation deals primarily with the blood variations and the basal metabolic rate, the factors which seem to influence these items only will be considered.

Frank Hartman[6] and his co-workers, about twenty years ago, developed the "general tissue hormone" theory of the corticoids of the adrenal cortex. They concluded that the cortical hormone (or hormones) is necessary for the normal function of all cells. Selye[7], in 1936, reported that animals exposed to a variety of nonspecific stressors respond with a discharge not only of adrenalin, but also of adrenal cortical hormones. The most striking feature of this response was its remarkable nonspecificity.

It is not known how a tension affects the hypothalamic centers and the anterior lobe, but a variety of factors can aggravate or mitigate the effect of a given stress at the prepituitary level. Nervous irritation or stress or tension, acting as a stimulus, tends to activate more markedly the vegetative centers and the autonomic nerves than the pituitary-adrenal mechanism. And in rabbits, lymphocytosis has been ascribed to parasympathetic; polymorphonuclear leucocytosis to sympathetic stimulation[8].

Little is known about the direct effect of autonomic nervous activity except that the splanchnic nerves, through their stimulation cause a discharge of adrenalin, which acts upon the anterior lobe, and in turn can affect the adrenals. It is generally accepted that the distribution of blood cells between the spleen and the circulating blood is influenced by adrenalin.

The release of gluco-corticoids (GC), which have significant effects on the number and types of leucocytes, is increased by any stressor influence on the anterior lobe, which will discharge adrenocorticotrophic hormone (ACTH). Hypophysectomy, however, does not prevent the lymphopenia seen in rats[9] after adrenalin administration. Obviously, some of the hematologic effects of the adrenals are independent of the pituitary and its effect on the adrenal cortex. The increased production and release of GC result from the discharge of ACTH under stress, even though they tend to diminish ACTH production through the "compensatory atrophy" phenomenon.

Many observers have shown that ACTH reproduces the typical early adjustment pattern of polymorphonuclear leucocytosis, lymphopenia and eosinophilia in man[10] and many other species.

These reports support the view that lymphopenia, at least the relative lymphopenia accompanied by eosinopenia and polymorphonuclear leucopenia, is truly characteristic of the early adjustment period produced by "emotional stress." It is difficult to reconcile this with the phenomonon of "emotional" lymphocytosis which often had been seen by early investigators in rats,[11] as well as in man[12].

It should be kept in mind, however, that many factors affect the blood count in the general adaptation syndrome. For instance, both adrenalin and the corticoids, liberated at this time, can cause a discharge of blood corpuscles from the spleen. The corticoids apparently also promote the destruction of lymphocytes. It is obvious, therefore, that the final effect of stress will again largely depend upon the conditioning factors, which vary greatly in different individuals.

The spleen is such an important reservoir of formed blood cells that considerable attention was given to the effect of splenectomy upon the hematologic response to various agents[13]. Under most experimental conditions, the spleen plays no important role in the changes in the leucocyte count produced by systemic stress.

Much thought has been given to the origin of the polymorphonuclear leucocytes which suddenly appear in the circulation during the "alarm reaction" period, and the fate of the lymphocytes and eosinophils which disappear from it. It seems most probable that the polymorphonuclear cells come from the bone marrow, as do the erythrocytes, but there is no evidence as to where the increased storage or disintegration of blood lymphocytes occurs under these circumstances.

The granular leucocytes and red cells arise, and it is thought by some investigators even though so distinctly different from each other in the mature form, from a common ancestral cell[14]. As this cell grows in the bone marrow, it is thought that there are two main lines of development in the daughter cells, one culminating in the mature red cell, another in the granular leucocyte. If this is the case, then by what mechanism and through what stimulation is it possible to get a marked neutropenia without an anemia as in the dyslexia blood picture? In the answer to this question may lie a partial explanation why many normal intellectual individuals are unable to function in the learning processes.

Kemp et al.[15], Weisberger et al.[16] and Guest et al.[17] in their investigations have found that there are leucopenia-producing substances. By creating an inflammatory process, Kemp and her coworkers produced a substance which caused a reduction of both polymorphonuclear and mononuclear cells and did not affect any of the other constituents of the blood. This effect was not mediated through the adrenal cortex since a decrease in leucocytes of equal magnitude occurred in intact and adrenalectomized rats. Both Weisberger and Guest through other means found similar factors. By transfusing leucocytes into the same rabbit from which they had been obtained, Weisberger created a sudden profound leucopenia. Intravenous administration of the supernatant fluid obtained by centrifugation of disintegrated leucocytes also produced a leucopenia in all cases. It is evident that there is a potent substance (or substances) present in leucocytes which is capable of affecting the level of the leucocyte count of circulatory blood. The effect is more than a mere filtering of foreign bodies by the reticuloendothelial system.

Menkin[18] identifies a leucopenic and leucocytic factor, and identifies a toxic substance which is liberated by injured cells and called necrosin. The presence of a leucopenia factor in exudative material, particularly if the exudate is at an acid pH, may be of help in explaining the leucopenia attending numerous inflammatory processes. The mode of action of the leucopenic factor, which appears to be a polypeptide, seems to be a trapping of leucocytes in various organs, such as the lung, liver and the spleen. The possibility of the existence of differences in the reaction of the recipient is indicated by the production of leucocytosis in one rabbit but not in the other receiving the same quantity of the same suspension. The leucopenia factor or necrosin contains a common glycogen depositing factor, since injection of either substance is followed by a deposition of large quantities of glycogen in the hepatic cells and to some extent in the cardiac muscle fibers.

Palmer et al.[19] observed that under certain conditions leukopenia developed in animals made deficient in folic acid, riboflavin, vitamin B_{12}, protein and certain amino acids. Rats fed desiccated thyroid, and a diet limited in caloric value, developed severe leucopenia and lost weight. This leucopenia involved both granulocytes and mononuclear cells and was not accompanied by anemia. It was not corrected by increasing any one of the constituents of the diet nor by

giving vitamin B_{12}, folic acid, ascorbic acid, whole liver powder, vegetable fat or yeast. Evidence was presented which suggests that leucopenia is related to a limited caloric intake.

Hellerstein et al.[39], on giving daily injections of extract of beef hypothalamus, observed a leucopenia in rats. This leucopenia involved a depression of both the polymorphonuclear and the mononuclear cellular elements. Hellerstein is investigating the hypothesis that the hypothalamus-pituitary system contains within it an endocrine-like principle capable of depressing the leucocytes.

It is evident that the final hematologic response to stress will depend upon the integrated proportions of the secretions of adrenalin, the gluco-corticoid hormones, ACTH, the autonomic nervous system, and the response of the reservoirs and tissues which produce and destroy lymphocytes, eosinophiles and polymorphonuclear cells.

DISCUSSION AND CONCLUSION

There are probably many complexly interrelated determinants in dyslexia, such as hormonal imbalances, functional cerebral defects, thwarting of the sublimation of the aggressive drive, disturbances in the interpersonal relationships, especially in the family climate, lack of motivation, and perhaps many unknown factors, which should prevent the assignment of any single causative factor. But, it is generally recognized and the extensive clinical experience of the Dyslexia Institute Staff indicates that a factor of stress or tension is present in almost all patients with reading difficulties. It is also evident, on the basis of the literature reviewed, that the factor of stress or tension would be manifested in a number of patients, if not all, by a change in the white blood cell picture. This was found to be true of the majority of patients in this study, as is demonstrated by the results as shown in the charts. That it was not true for all cases might be expected from the complexity of factors involved as portrayed in the review of the literature. In view of the complexity of the factors involved in the alterations in the white blood cell picture, we could hardly expect to have found the same picture in all the patients, since their symptoms were so diversified. It has been so clearly demonstrated in the past 15 years that the effects of stress may be manifested in so many different ways in the somatic parts of the body, it is no longer logical or necessary to believe that stress should produce the same ob-

jective lesions, signs and symptoms in every patient, or at least to the extent that microbacterium tuberculosis does. It is unphysiological thinking, in the terms of the ideology of bacterial diseases, that causes one to believe that stress should act likewise. The error of the logic should be obvious. Why does stress have to act on the body like a bacterium? There is no biologic reason to expect that it should, and in view of the complexity of the factors involved, it would not affect every individual similarly. So, in some individuals their resultant "physiological compensatory response" to stress and any other influence is a factor in the etiology of dyslexia, and in some dyslexiacs the effects of an abnormal autonomic-pituitary-adrenal-thyroid (gonad) function on the white blood in response to stress is found. These symptoms merely occur simultaneously, and form only a part of the complex physiological manifestations found in the dyslexiac child.

We wish to acknowledge the financial support given by the Illinois Department of Welfare in making further research possible; also, to thank Drs. Anton J. Carlson, Andrew C. Ivy and R. Smith Park for their help and suggestions in this study.

BIBLIOGRAPHY

1. Shuey, H. E. and Cebel, J.: Surveys of Laboratory Accuracy. Bull. U.S. Army M. Dept., 9:799, 1949.
2. Albritton, E. R.: Standard Values in Blood, 1952.
3. Park, G. E. and Appleman, J. H.: Dyslexia from Physical Viewpoint. Illinois M.J., 97:1, Jan. 1950.
4. Selye, H.: Stress. 1st Annual Report, Acta, Inc., 1951.
5. Liddell, H. S.: Conditioning and Emotions. Scient.Am., p. 48, Jan. 1954.
6. Hartman, F.; Brownell, K. A. and Lockwood, J. E.: Cortin as a General Tissue Hormone. Am. J. Physiol., 101:50, 1932.
7. Selye, H.: Stress. Acta, Inc., 1950.
8. Camp, W. J. R.: Effect of Drugs on the Number of Circulating White Blood Cells. J.Lab. & Clin.Med., 13:206, 1927.
9. Hungerford, C. F.: Effect of Epinephrine in Decreasing Number of Circulating Mononuclear Leucocytes in the Rat. Proc.Soc.Exper.Biol. & Med., 70:356, 1949.
10. Saunders, R. H., Jr. and Adams, E.: Changes in Circulating Leucocytes Following the Administration of Adrenal Cortex Extract and Adrenocorticotrophic Hormone in Infectious Mononucleosis and Chronic Leukemia. Blood, 5:732, 1950.
11. Farris, E. J.: Emotional Lymphocytosis in the Albino Rat. Am.J.Anat., 62:325, 1938.
12. Farris, E. J.: Increase in Lymphocytes in Healthy Persons Under Certain Emotional States. Am.J.Anat., 63:297, 1938.
13. Perla, D. and Mormorston-Gottesman, J.: The Spleen and Resistance, 1935.
14. Carlson, A. J. and Johnson, V.: The Machinery of the Body. Univ. Chicago Press, 1953.
15. Kemp, L.; Cartwright, G. E. and Wintrobe, M. M.: Studies on a Leucopenia Producing Factor Obtained from Inflammatory Tissue. Am.J.Physiol., 165:554, 1951.
16. Weisberger, A. S.; Heinle, R. W.; Storaasli, J. P. and Hannah, R.: The Fate of Transfused Leucocytes. J.Clin.Investigation, 28:818, 1949.
17. Guest, M. M.; Murphy, R. C.; Bodnar, S. R.; Ware, A. G. and Sugers, W. H.: Physiological Effects of Plasma Protein: Blood Pressure, Leucocyte Contraction, Smooth and Cardiac Muscle Activity. Am.J.Physiol., 150:471, 1947.
18. Menkin, V.: The Leucopenia Factor of Exudates. Science, 105:538, 1947.
19. Palmer, J. G.; Cartwright, G. E. and Wintrobe, M. M.: Experimental Production of Leucopenia in Rats by Thyroid Feeding. Am.J.Physiol., p. 385, Nov. 1952.
20. Hellerstein, G.; Holtkamp, D. E.; Hickey, M. E.; Hill, R. M. and Buchanan, A. R.: Effect of Hypothalamic Extract on Leucocytes of Infant Rats. Am.J.Physiol., 171: 106-113, Oct. 1952.

AN ANALYSIS OF THE CAUSES OF PEDIATRIC DEATHS

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At Hillcrest Medical Center, Tulsa, Oklahoma, in 1954 there were 3103 pediatric admissions and 31 pediatric deaths, 17 of whom died within 24 hours. Included in this series are 5 neonatal deaths which were brought in from home delivery. There were 14 deaths under 1 year of age, 14 deaths over 2 years of age, and 3 deaths from 1 to 2 years of age.

The chief causes of death from 2 to 14 was bulbar polio. There were 4 deaths due to bulbar polio, ages 3, 5, 6 and 8. One of these children had received 2 polio shots and had a tonsillectomy within one month. Two of these children were placed in the iron lung before expiration and one had a tracheotomy. Two expired within 24 hours of admission.

One, age 11, had hydrocephalus. Two died of meningitis, 1 influenzal, 1 meningococcic. Three had brain tumors, ages 6, 8 and 14. Two had skull fractures. One had adhesive pericarditis. One had necrosis of the liver and encephalitis.

There were no deaths due to pneumonia among those over 2 years of age. Under 2 years of age, the chief cause of death was pneumonia in the preventable group, and congenital anomalies in the nonpreventable group. Death among those from 1 to 2 years of age were due to: (1) intestinal obstruction; (2) hydrocephalus; (3) croup. From 1 month to 1 year, the causes of death were: two pneumonias due to pseudomonas aeruginosa; 1 pneumonia due to A. aeruginosa; 2 hydrocephalus; 3 congenital hearts; 1 tracheotomy associated with a branchial cleft cyst.

Under 1 month of age, one child went home from the hospital well five days after birth to a psychotic mother who had spent several months during pregnancy in a mental institution and didn't want her baby. The child returned to the hospital moribund, probably due to neglect. The second baby had massive pneumonia. The third was a twin, premature child, who received achromycin as a preventive prophylactic antibiotic while in the nursery and developed necrotic ulcerative colitis. The other twin, who received sulfadiazine as a prophylactic, lived.

There were 2 prematures under one day who expired within an hour of admission. Both of these were moribund on admission.

In analysing these deaths, it was felt that the majority of them were not preventable. However, in the age group from 2 to 14, the two meningitis cases probably could have been saved if a routine had been followed, such as was followed on all subsequent cases of meningitis of the year 1954, in which there were no further deaths. In all cases of meningitis we feel that after the spinal fluid has been taken and a culture obtained, before it can be reported, we must cover all possibilities and, therefore, sulfadiazine, 1 grain to 2 grains per pound to 24 hours is given following an initial dose of at least half of the amount. Sulfadiazine penetrates the meninges better then almost any other drug and is still the treatment of choice in meningococcal and pneumococcal meningitis. Chloromycetin is more effective against influenza and is also given to all cases, before the culture is reported, in full dosage from 50 to 100 mgm. per pound in a severe infection. Streptomycin and penicillin may or may not be given in addition to these two drugs. Medication should be continued in adequate dosage until 5 days after the culture is negative.

In the cases of bulbar polio, we feel that tracheotomy and early placing in a respirator at the earliest sign of respiratory failure may be life-saving. The first 24 hours is extremely important in bulbar polio and the attending doctor should remain almost constantly at the side of the bulbar polio patient until he is sure that tracheotomy has been done if there is excessive mucus or difficulty in swallowing, and that he has been placed in a respirator if the respiratory muscles of the intercostal area and diaphragm are embarrassed even moderately. It is felt that it is better to place a patient in the respirator, if there is any doubt, because he can always be removed and tried outside the respirator from time to time from the first 24 hours on. All children in the respirator should have repeated throat cultures and antibiotics changed as cultures indicate. Antibiotics should be continued as long as mucus is excessive.

Of those under one year who died of pneumonia, all were treated with penicillin and none of the organisms were sensitive to penicillin. At Hillcrest Memorial Hospital it has been found that if the case does not respond within 24 hours to penicillin, a throat

culture should be taken and chloromycetin started without delay, because as a rule sensitivities have shown the majority of resistant organisms to be more sensitive to this drug then any other. In 1954, there were no deaths due to overloading with fluid, as there had been in the previous year, because fluids were strictly limited to 20 cc. per pound every eight hours or less after initial hydration.

In conclusion, we believe that we may save many lives by early tracheotomy in bulbar polio and croup when symptoms warrant; second, have proper selection of antibiotics in meningitis and pneumonia; third, have careful regulation of fluid and electrolyte balance; fourth, limit or discontinue prophylactic antibiotics on premature infants.

INSULIN IN TREATMENT OF CHOREA MINOR. (Minerva pediat., 6:457-458, June 30, 1954). Insulin was used to treat six girls and three boys with chorea minor at the children's clinic of the Ospedale Maggiore in Milan. The children's ages ranged from 8 to 12 years. An acute attack of rheumatic fever had occurred in four children shortly before the onset of the condition; one had scarlet fever. Chorea minor was the first manifestation of rheumatic disease in one, while the origin of the condition was unknown in the others. The drug was given in a dose of 5 to 6 units three times daily immediately before meals, and the treatment was continued for 28 days. Restoration of the muscular tone and gain in appetite were observed soon after the therapy was started. A progressive clinical improvement became apparent during the second week of therapy with resumption of the motor function of the extremities, of movement coordination, and of speech articulation. The children were clinically cured within one month. A relapse occurred in the child in whom chorea minor had been the first sign of rheumatic disease, but it was controlled in six days with the administration of an antirheumatic preparation. Insulin therapy shortened the hospital stay of these children from 50 to 30 days. At the end of the treatment the children had gained an average of 2 kg. in body weight. Pennati attributes these good results to a "peripheral" action of insulin rather than, as Mayerhoffer has asserted, to its influence on the neurohypophyseal system.—*J.A.M.A.*

TERRAMYCIN IN THE TREATMENT OF WHOOPING COUGH*

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The isolation and development of Terramycin in 1950 with its wide antibiotic spectrum offered hope in a new weapon against infectious diseases. Among these infections in infancy and childhood, whooping cough is probably the most troublesome. While Jackson et al., Sayer et al., King et al., Craig et al., Beckel and Plattner report favorable results, R. G. Amer in his paper presented before the American Pediatric Society (Atlantic City, May 1951) gave the opinion that the new antibiotics, including Terramycin, are probably not more beneficial than penicillin in affecting the course of pertussis. So evidently opinions regarding the value of Terramycin in the treament of whooping cough seem to be still in the balance and more organized work seems to be essential before a final and fair judgment can be arrived at. The present work was performed by us with the aim of forming our own personal opinion regarding the efficiency of this new antibiotic in the treatment of pertussis.

Choice of Cases. Fifteen cases were selected. The age varied from 2 months to 6 years. Four cases were over two years of age. The other eleven cases were under two. Two cases were in the catarrhal stage, the other 13 cases were in the first week of the paroxysmal stage (from 2-7 days).

The illness was in different stages of severity. The severity was gauged by the number of paroxysms per day, the average duration of the paroxysms and the occurence of vomiting, cyanosis and convulsions. Accordingly, our cases were grouped as follows: Severe cases, 3; mild cases, 2; moderate cases, 8; catarrhal cases, 2.

Diagnosis. Eleven of our cases, including those in the catarrhal stage, were contacts of well-developed cases of whooping cough. Eleven cases, including those who did not give a history of contact, exhibited a rather characteristic paroxysmal cough, at least

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tickling in the throat. All the cases had a lymphocytosis of over 60 per cent. The sedimentation rate was performed in 10 of the cases and showed normal figures.

Dosage. Ten cases received Terramycin Hydrochloride in the dosage of 80 mgs. per Kg. body weight for 7-10 days.

The other 5 cases received the drug in doses of 50 mgs. per Kg. body weight for 7-10 days. The drug was administered in the form of drops, except in the case of older children when capsules were given with a little water to swallow. The drug was given about half an hour before meals on an empty stomach. The calculated daily dose was given in equally fractional doses 6 or 8 hourly.

RESULTS

Eleven of the fifteen cases treated showed a definite reduction in the severity and duration of the individual paroxysm on the third to fifth day of treatment, the attack thus loosing its typical spasmodic and repetitive character. Thus, evidently, the paroxysmal stage was diminished to from 7-12 days instead of the usual 3 weeks. The other four cases showed only a slight improvement. These were mostly severe cases from the start of treatment.

Comment. The results obtained show that Terramycin is probably acting not only in combating the secondary infection, but also has evidently a specific action. We believe it hard to make a comparison between the action of such antibiotics as penicillin and Terramycin. It is certainly of special value in cases with secondary infection where it may be preferable to Chloromycetin by virtue of its wider bacterial spectrum. Also it seems of special value in cases of very dry spasmodic coughs where a differentiation between early pertussis and influenza cannot be made by available means, as Terramycin seems to affect the latter cases (influenzal) more than does Chloramphenicol. Also, the fact that Terramycin, supplied in the dry form, can be used easily in emulsion or oral drops is certainly an advantage over the Chloramphenicol syrup which may lose its effectiveness in storage and so the former may be more practical in the treatment of infants. However, it was noted on many occasions that the cough in the cases treated by Terramycin retained a dry and slightly irritative character instead of becoming loose and easy as it was observed in many of the cases treated by Chloramphenicol. (Khalil and Abdin, 1950)

Also diarrhea and vomiting occurred singly or together on the fourth to seventh day of treatment in 4 of our cases, so that apparently they are a bit more usual than with Chloromycetin and are probably likewise the result of irritation of the gastro-intestinal tract by the drug. No remarkable changes in hemoglobin level and R.B.C. count was noticed, while in the white blood count there was a tendency to a reversal toward normal in most of the cases.

As regards dosage we did not notice an advantage in larger doses; also we felt that longer intervals and smaller doses were probably less liable to cause signs of bowel irritation. Also because of the frequency of vomiting and diarrhea by the fifth day and because of response of most cases by the fifth to seventh day we think it might be advisable to administer the drug in an initial course for 5-7 days, i.e., until the cough abates and then either give half the dose for another 5 days or stop, to repeat only should an exacerbation threaten to occur.

SUMMARY

Fifteen cases of early whooping cough received Terramycin in doses of 50-80 mg. per Kg. body weight per day, 6-8 hourly, half-hour before feeding.

These showed much improvement mainly in intensity of cough by the fifth day. The effect was less pronounced in the more severe cases (the remaining 4).

Diarrhea and/or vomiting occurred on the fifth day in 4 cases. No remarkable blood changes were observed.

CONCLUSION

Terramycin is apparently one of the superior beneficial drugs in the therapy of whooping cough in its early stages.

REFERENCES

1. Sayer, et al.: Clinical, Pharmacological and Bacteriological Studies. Am.J.M.Sc., March 1951.
2. King: J.A.M.A., 143:1-4, May 6, 1950.
3. Jackson, et al.: Am. K. Y. Acad., Sc., 53:422-426, Sept. 15, 1950.
4. Jackson, et al.: J. Immunol., 65:419-424, Oct. 1950.
5. J. Pediat., 38: 411-422, April 1951.
6. Year Book, p. 154, 1951.
7. Khalil, A. and Abdin, Z.: J. Egyptian M. A., No. XI, 1951.

PEDIATRICS AT THE TURN OF THE CENTURY

From time to time the Archives, which was the first Children's Journal in the English language, will reprint contributions by the pioneers of the specialty over fifty years ago. It is believed that our readers will be interested in reviewing such early pediatric thought.

THE CHANGES IN THE MANAGEMENT OF LARYNGEAL DIPHTHERIA TREATED BY INTUBATION*

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So many changes have taken place in the method of treating diphtheria, and especially that type known as diphtheria of the larynx or membranous croup, that a paper on this subject can never fail to interest, and may, in some measure, instruct. This class of cases, formerly considered a most fatal type, should always be considered as the direct cause of the bacteriological investigations resulting in a specific treatment, Behring's heil-serum; and in a specific operation, intubation. Medical science can give no better examples of the progressive strides of the zealous investigator than the discovery of the specific treatment of diphtheria, and the evolution of intubation tubes. Even as the discovery of the origin and cause of the disease resulted in the discovery of the remedy, so the study of the various types and manifestations of the malady resulted in various methods to meet them. While the treatment of the disease is most modern and belongs to the latest school of investigators, the study of the treatment of the symptom "stenosis" is ancient, and is linked with the history of medicine.

Many plans have been devised to combat this condition, but to briefly summarize, only two have remained—tracheotomy and intubation—as certain methods of treatment. The choice of either operation was determined by the experience of the operator until the advent of the serum treatment, when the operation of tracheotomy was replaced by the operation of intubation. Now we can safely assert that intubation of the larynx should be the only operation for the relief of this kind of stenosis.

*Read before the Philadelphia County Medical Society.
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In one of my earliest papers on this subject ("A Report of 100 Cases of Diphtheria of the Larynx Treated by Intubation," Medical Bulletin, September and October 1894), I made the following observations regarding the choice between intubation and tracheotomy:—

"(1) To intubate always, when no professional assistance is at hand, no matter what the age of the patient. (2) Under the age of four years, always to intubate. (3) Between the ages of four years, and seven years, intubate primarily, and do tracheotomy secondarily. (4) When loosened membrane or the spread of the disease into the trachea is suspected, perform tracheotomy. (5) In the class of cases met among the poorer people, when skilled attendance can hardly be obtained, intubation should always be done."

While these indications still hold good and should not be disturbed, the specific character of our remedial agent is now to be considered, and enters largely into any indication for treatment. For this reason and with an intimate knowledge of the method of using the serum, as advised by Behring and the results obtained from the judicious and exact methods of administering it, I would modify these indications and summarize them thus:

Intubate in every case, no matter what age, or what time of the disease, and tracheotomize only when the intubation tube is either too small and does not penetrate entirely the seat of the obstruction, or where the membranes, loosened by the use of the serum, are pushed ahead of the tube into the trachea.

The advantages and disadvantages which belong to intubation, and which were also factors in deciding the choice of operation, have remained the same as I have before described:

The advantages are: (1) The speed with which it can be performed. (2) Bloodlessness. (3) Lack of shock.

The disadvantages are: (1) It clouds the prognosis. (2) The tendency to heart failure. (3) The dangers, pushing down false membrane; suffocation, by the finger in attempts to intubate. (4) The difficulty of nourishing the patient. (5) The difficulty in deciding when the tube is to be removed.

During the past eight years it has been my endeavor to investigate the "disadvantages" and to see by what manner or means we could combat these objections, and if possible utilize them or place

them in the list where either one or all could be of some value. To this end I have from time to time presented various papers on this subject. The field of study is a large one and the opportunities rather limited by reason of the lack of material. Other operators, notably John Bokai, of Budapest in Hungary, Austria; Waxham, of Denver, Simpson, Dillon Brown, Fischer and Francis Huber, of New York; Cheatham, Massei, Rosenberg, Trumpp and others equally as zealous, have undertaken the same task, and the results of our labors have given us a better conception of this operation, and a clearer insight into the various accidents, complications and sequelæ that have been met with and that have been classed as "disadvantages." The results have been most surprising, and in none so gratifying as in the "after-treatment." If I quote again from my paper of ten years ago, I do so simply to show the change in my method of treatment, for in this change not one rule or method pursued at that distant time, has remained with me. If I were to treat a case now as I did formerly, I would consider my work superfluous; and if ten years ago I had treated a case as I do now, I would have considered my work insufficient, neglectful or of no value. I again quote from my former paper:

"After intubation, as soon as practicable, I permit the child to drink water, milk, wine, or anything. I permit the child to hold the glass or cup, and do as it pleases. Generally the drink causes coughing, and mucus and membranes are frequently brought away."

At the present time this technique remains unaltered. Preliminary to intubation, however, I use a solution of peroxid of hydrogen by means of an atomizer. This is used freely at the time, and I even keep the tube in the same solution until I am ready to intubate. Immediately after intubation I apply the spray, endeavoring by its use to thoroughly clean the throat, larynx and parts within reach. Formerly I directed that this spray be used hourly, simply as a matter of routine; I now use it only when indicated. This I shall mention further on in this paper.

In former times, when medicines were used empirically for diphtheria, I would direct their use at such frequent intervals, as hourly perhaps, that the after-treatment became a constant treatment. There was a constant succession of applications of the atomizer, administrations of food or medicine, inhalations (for the inhalation of slaking lime was one of the specially pursued

treatments) and the like. Let me quote again: "Lime inhalations I have found of questionable benefit. I have used them in cases that have recovered, and also in those that have died. A piece of unslaked lime is placed in a clean bucket with some cold water; the steam as it arises is brought to the child lying beneath an improvised canopy, made of an open umbrella and sheet. These inhalations are used judiciously, about once every hour, and are continued for about fifteen minutes." From these indications one can judge how onerous was the treatment of a given case of laryngeal diphtheria when intubated. The mortality records were being reduced; indeed we had reached 68 per cent, when the serum-treatment came as an aid to prove the real utility of the intubation.

What is our present method? It is mainly to the specific action of Behring's diphtheritic heil-serum that the changes in our treatment are due, and the after-treatment in each case is inseparably interwoven with the use of the serum. Hence with a knowledge of how the serum will act, the operation for the relief of the stenosis has become an exact one. Analyzing the various cases as we meet them, I have learned to look upon this special form of the disease as a twofold type, and in my operative procedure I adapt methods to whichever type the case presents. These types I designate as primary, the socalled membranous croup, in which the disease begins primarily in the larynx; and, secondary, the socalled "true diphtheria of the larynx" in which the disease begins as a faucial, nasal or tonsillar diphtheria and extends to the larynx by the contiguity of the membrane. We may have the disease appearing secondarily to, or as a complication of, another infectious disease, such as scarlet fever, measles, whooping-cough, typhoid fever, or the like; under these conditions it is well to consider it in the class of the secondary type, and treat it accordingly.

Much depends upon whether the type be primary or secondary in determining whether to inject the serum and wait for intubation, whether to intubate first and then use the serum, or whether to intubate and first use other means, as the injection of strychnin or saline solution, and leave the question of specific treatment in abeyance, in the face of imminent danger from death.

Most of my cases are seen in the practice of others, generally when the case is very far advanced and when the operation of in-

tubation is an urgent one. The question of the use of Behring's heil-serum being no longer a debatable one, it may have been used, or I may use it at the time of the intubation. Therefore the diagnosis of the type bears greatly upon the treatment with the serum, and influences to a considerable extent the question of the prognosis. For example, if a primary case be seen so late as to require intubation, it may be, and in most cases will be, early enough to be influenced by the serum treatment. The danger in these cases is mostly due to the stenosis, this being relieved and the diphtheria treated with the serum (no matter how late, provided the disease still be in the larynx only), even if it be on the fifth, eighth or even the tenth day, a favorable prognosis can be given, and the tube can be removed on the fifth day after intubation, and remain out. The explanation of a case like this lies in the fact that the larynx is devoid of lymphatics, there is consequently very little infection or toxemia, the serum used is sufficient to neutralize this and the case recovers. If such a case of primary laryngeal diphtheria be seen early enough, that is, in the first two days, and the serum be used in sufficient dosage, the case will in all probability get well at once and intubation will not be required.

In the secondary cases where there are all the evidences of diphtheria, either faucial, tonsillar or nasal, what should be done when the larynx becomes involved?

Here the condition is vastly different. The danger in cases like these lies not so much in the "stenosis" as in the "toxemia." These cases are, happily, at this day very rare. The diphtheria serum treatment is now sufficiently well known, and so universally used, that this particular type of laryngeal diphtheria is an exception. However, in cases like these, even when the stenosis is not very well marked, intubation should be performed at once. Why? The progressive type of the disease always reaches the point of danger to life by reason of the suffocation which results from the progressing membrane, and if relief be not given at once, the patient, though obtaining a sufficient amount of the specific heil-serum, may not live long enough (from 72 hours to 120 hours) for the serum to do its work. Hence, in all cases of secondary diphtheria of the larynx, intubation should be performed at once, or at the earliest indication of need, thereby saving time and seizing the opportunity for the greatest good.

When diphtheria of the larynx comes as a complication to measles or other disease, and the symptoms are not recognized early (that is on the first two days) when a sufficient amount of the serum can be given, even as an immunizer, then should intubation be performed at once; for the progressive stenosis of the secondary type occurs here, and the case may become much worse, as regards the stenosis, before the serum will do its work.

I take it that you have all become familiarized with intubation, therefore to describe its technique would be superfluous. We will suppose that we have just intubated a case, the questions now to be answered are: (1) Have you intubated correctly? (2) Can you leave the case safely? (3) What shall be the medical treatment of the patient? (4) How to feed the patient?

To the first question, the patient's condition will be a sufficient answer. If you have succeeded in placing your tube correctly, there will be at once a whistling sound followed by a cough. The child will attempt by coughing to dislodge the tube. I may here give my method of dealing with the tube, before and during the operation. These tubes are of metal and are always newly gilded. No matter how often I intubate in any given case, I always use a comparatively new tube. When I receive the tubes from the gilder, I boil them for a short time in sterile water and then place them in sublimate cotton until used. When I wish to use them, I place them again in boiling water, and then, previous to the intubation, in a solution of peroxid of hydrogen.

As a preliminary to intubation, I invariably use a spray of peroxid of hydrogen. This, by means of an atomizer, is thrown into the mouth, on the tonsils, into the pharynx and larynx, and indeed upon every point in the throat that can be reached. This solution, as you all know, makes a rather thick lather, this lather acts as a lubricant to make the tube slip easily into place, and also to prevent the accident of pushing down the loosened membranes or the like. Experience having proven to me, that only when the parts are very dry, and difficulty is met with in entering the larynx, do accidents occur. Using the solution of peroxid reduces this danger to a minimum, so that the peroxid has real value in this operation. After the tube is in place, I may use this spray several times in succession, or until I hear the air enter and leave the tube in a normal manner. I then cease using my spray, and give

the patient some stimulant or other to drink, and after I am satisfied that the tube is correctly placed and that everything regarding it is in a perfect order, I then consider the next step, viz., can the patient be left alone or with untrained attendents? This each case must decide for itself. Generally if, after an hour has elapsed, the child rests easily, the air enters and leaves the lungs unimpeded, the condition of the child shows that the blood has become again filled with oxygen, the danger from suffocation has passed and the child can be left safely for any number of hours that the after-treatment may require.

The medical treatment depends upon the type of case, that is, whether it be a primary or secondary, or whether it be a diphtheria pure and simple, or a complication of another disease. I may summarize these observations briefly thus: The serum treatment of diphtheria having resolved itself into a "specific" treatment as regards the cause, each and every case, no matter what may be its type, whether a primary or secondary, a complication or a reinfection, is treated by the serum, and for the rest our efforts must be to meet symptoms, or to treat one that by reason of its magnitude has become as serious as the disease itself.

Generally in my consultation work, I inquire as to the method of treatment most familiar to my colleague, and if his method is suitable, I reconcile the future treatment of the case to his methods. Thus if the physician favors the use of iron, or mercury, or the like in the treatment of his cases, I do not permit his treatment to be disturbed, but continue the same. My whole endeavor is to treat the new condition of the patient, that the presence of the tube introduces. This resolves itself into: (1) Getting the patient to accommodate itself to the presence of the tube. (2) Getting the patient to take a sufficient amount of necessary food, stimulants, or medicines. (3) Preventing any accidents arising from or by the presence of the tube, such as clogging of the tube by loosened membranes or inspissated mucus or other secretions, or expectoration of the tube by coughing or vomiting, or injuries or irritations with inflammation, edema or the like from the presence of the tube. (4) The prevention of complications or sequelæ, such as pneumonia, atelectasis, heart failure, the prolonged wearing of the tube, or tracheotomy.

To answer the first question I may say that in all my intubations

I always remove the silken thread that is passed through the eye of the tube. It sometimes causes vomiting and always irritates. The child continually chews upon it. If it be permitted to remain there is always the additional danger of the tube being suddenly withdrawn, either by the patient, or by some accidental pull upon it. Hence I feel that the additional freedom given the patient by its absence is more beneficial than any security its presence gives. Sometimes I find difficulty in getting the patient reconciled to the tube's presence. When I find the patient excitable, so that the mere presence of the tube acts as an additional excitant, my endeavor is to quiet the patient, and the more so, if the child suffers additional pain from the hypodermic injection of a large quantity of serum, or has great difficulty in swallowing, or pain in the throat, or possibly pain in the ear.

For this purpose there is no better drug than opium, in any form. For example, to a child three years old, fifteen or twenty drops of paregoric every two, three or four hours, as required throughout the illness. In older children hypodermics of morphin or even opium in suppositories may be used. This one drug has proven sufficient to meet all indications along this line, and its value is far greater than one would suppose in the grave conditions met with immediately after the intubation, and sometimes after extubation. Experience has proven to me that if a patient lives through the first twenty-four hours with a tube in the larynx there is a fighting chance of getting the case through. The greatest danger lies in the heart. By the use of the opium the whole circulation is quieted, so that the most alarming symptoms subside, and the case assumes a more favorable aspect.

After the patient is reconciled to the presence of the tube, the next endeavor is to suitably nourish the child. If the patient is an infant, or below the age of two years, the difficulties are greater than in later years. The reason of this is the liquid character of the food. It is an almost impossible task to get liquids into a child's stomach, if a tube be in the larynx, without a little fluid engaging in the tube and bringing on a fit of coughing with all the consequences thereof. Hence in each case we should endeavor to devise some method of avoiding this. If the patient is a suckling, the mother is instructed to nurse lying on a bed or couch,

with the head and chest lower than the rest of the body. The food will thus pass over the tube by passing over the roof of the mouth. For a "bottle-fed" the position during feeding should be arranged in a similar manner, so that the child can nurse with less difficulty. If the patient be one of older years, used to a mixed diet, the difficulty is not so great, for a semi-solid diet may be given, such as pap, crackers and milk, jellies, lady-fingers soaked in milk, oysters, ice-cream or the like. And if the case be a child still older, who can take table food, anything and everything the child craves may be allowed, even if it be a piece of meat or bread. As the tube acts mechanically as an impediment to the entrance of food into the stomach, devise a method of avoiding the obstruction and favorable results are gained. While giving semi-solids, or food-stuffs that are porous, such as the lady-fingers, we can moisten them with stimulants, such as wine, or whiskey, and by this means we can often give very appreciable amounts of necessary medicines to our patients.

Our next care must be to prevent accidents; first of all the clogging of the tube. Should the lumen of the tube become narrowed by reason of the secretions becoming inspissated or dried, we can by the use of the atomizer and the peroxid of hydrogen, liquefy and remove them. Should it be impracticable to apply the spray, or should this be impossible, we can use the peroxid diluted as a gargle or even as a drink; the small quantity that engages in the tube is sufficient to act as a cleanser. Should the foreign substance be a piece of loosened membrane the procedure is the same, only our efforts must be more energetic. Should this method be unavailing our recourse then is the removal of the tube, and, if necessary, prompt reintubation.

Another accident, and one that is a natural result of coughing, vomiting, or the clogging of the tube, is extubation. In very many instances such a removal of the tube is a very favorable sign and indicates the convalescence of the patient. If we find that the patient can exist without the tube in the larynx we can consider the case as "cured" and need no longer use it. If, after the tube has been removed by some sudden exertion, the stenosis still persists, prompt reintubation is the rule. This accident is more frequent in cases that have a coexisting bronchitis, or where the tube is somewhat

too small for the particular child. If, therefore, we find the patient ejecting the tube, almost as promptly as he is intubated the only remedy is to pass a larger tube. Sometimes it is necessary to use a tube one or two or even three sizes larger than the one normally required. It is a very good rule in such cases, where the patient lives quite a distance from the operator, to pass a larger tube at once, and thus prevent any accident from too long absence of the tube. Whilst the introduction and the extraction of the tube may be made in the most skilful way and the operation be entirely devoid of any injury, the tube by its presence may exert an evil influence, like any foreign body, and this sometimes despite every effort to prevent it. The cause is the prolonged presence of the tube, that is, the necessity that compels the presence of the tube even after the initial disease has disappeared. If, by the presence of the tube, an irritation of the mucous membrane of the larynx is set up this may lead to edema or to an inflammation, which in turn gives place to ulcerative action going so far as to destroy the tissues and causing most alarming symptoms of suffocation from collapse of the cartilages for which it may be necessary to continue the tube for an indefinite period, or to perform tracheotomy.

These injuries have been fully investigated by Bokai and others and the result of these observations has been to teach us always to endeavor to prevent these complications by an early extubation. If the tube can remain out the case is safe. If not, we proceed in the manner to be described further on.

A natural question always asked in intubation is "What are the complications most to be feared?" The dangers supposed to threaten are pneumonia and atelectasis. The most real danger is from heart failure.

Pneumonia or "schluckpneumonie" as a result or complication of the intubation is to my mind a theoretical danger. I have never seen it. Indeed, I question whether it has ever been seen. I do not deny that pneumonia is present in our cases and frequently enough to be classed with our prognostic signs, but I have always found it to be the result of the disease and not the treatment. I have seen it often enough to know that it exists, but I invariably find it in a certain class of cases and not in all. For instance, pneumonia may frequently, and often does, follow after intubation (even two or three days after the tube is removed and the case

as regards the laryngeal difficulty is cured) and in cases of laryngeal diphtheria that come as complications or sequelæ to measles. Again it only comes in those cases of measles and diphtheria that have been neglected. In other words, in those cases in which the serum has been used very late, and in which intubation was performed almost as a "last resort." Here we may find atelectasis and though this may occur in various types of the malady we always find it in the neglected cases. The cause is not far to seek. For the patient when almost suffocating makes great efforts to inspire. The result is a collapse of the lung. In all cases that have died from pneumonia or from atelectasis, that I have been fortunate enough to investigate, I have never found any foreign substance in the lungs, or even in the trachea. It is true that frequently calcareous deposits are seen in and around the tube but these are more in the nature of what is to be expected when a metallic substance is placed in a cavity of the body. It may be likened to the tartar that gathers on a gold crown in a normal mouth and denotes nothing.

The treatment of coexisting pneumonia is really a work of art. We cannot pursue the same methods as in an uncomplicated pneumonia. Indeed every detail is different. For instance, in a pneumonia of the simple kind, we expect the certain limitation of the disease to be a factor and treat the case accordingly with wet packs, sponging or similarly. In pneumonia with intubation, such an expectation is erroneous. The variety and the course of a pneumonia in intubation is vastly different. For instance a "crisis" I have never met. Hence the treatment of these conditions must be different. Our endeavors should aways be to supply a supporting treatment. No wet packs but stimulation, judicious and accurate. It must not be forgotten, in the choice of our remedial agents, that the case is one that may be of long duration. We must never lose sight of the origin of the disease, that is, the diphtheria or the measles, and the presence of the tube in the larynx. In the treatment that must be pursued our very first endeavor must be to treat the diphtheria and get rid of the tube. This can be accomplished in from five to seven days. After the removal of the tube, the pneumonia may still be present, either unchanged or improved. The treatment of this condition must be persisted in and a satisfactory result may be had. For the treatment of a coexisting pneumonia or even a bronchitis, proper measures should be taken from

the moment of intubation. These include the administration of digitalis, in the form of an infusion or tincture, and carbonate of ammonia, or the aromatic spirits in suitable doses, and strychnia which belongs (with me) to the management of every case of diphtheria, and especially to those intubated.

For the atelectasis, I use counter-irritation, oxygen inhalations, and diffusible stimulants. Even after the alarming symptoms have somewhat disappeared, we may still have to treat an edema of the lung tissue that was the subject of the collapse.

The most constant danger in intubation is "heart failure," or more properly, paralysis of the heart.

No one can cure "heart failure" and I am beginning to believe that no one can cure "beginning (true) heart failure." Hence it should always be our endeavor to prevent this complication. Even if the pulse rate is good, and the physical condition of the patient of the best I take it to be good practice always to give such medicaments as are used to strengthen the heart muscles. I would most earnestly emphasize this, for I have so often seen sudden heart failure in cases where it was least expected, and in other cases that had been most carefully watched for any indication, that I have now made it my rule in practice to begin the after-treatment of every case of intubation with a hypodermic injection of a suitable dose of strychnia. The strychnia I continue, and use it as religiously as I would the nourishment or the stimulant. In every case of diphtheria of the larynx intubated, of any type, I would make this plea as earnestly as I would that for the serum. If I were to intubate a case of the type coming as a sequel to measles that had been neglected, I should begin my treatment with a hypodermic injection of strychnia, even before the intubation, and most certainly before the serum. So much good have I seen result from the correct use of the strychnia, that almost hopeless cases have been cured and the use of the tube and serum made possible by the prior use of the strychnia. For these reasons, I always direct, no matter what may be the treatment, that as long as the tube is in the larynx or so long as the patient requires medical attention, so long should strychnia be the sheet-anchor of the treatment.

To summarize the after-treatment of intubation in laryngeal diphtheria:

First, the introduction of a suitable tube, not in ratio to the age, but in ratio to the size and the condition of the child.

Second, food, liquid, if possible; semisolid, or even solid if necessary.

Third, strychnia, in proportionately large and decided doses, perhaps in increasing doses.

The most serious question remaining now is the removal of the tube. This requires considerable thought. Since the introduction of the serum treatment the experience gained has been of much assistance in deciding this question. It has been proven by clinical manifestations, that it takes from 72 hours to 120 hours for the membranes to disappear from the throat in these cases. This is the general rule. Of course there are exceptions. However, being guided by this, I never make my first attempt at a removal until 120 hours have elapsed. If the case be a normal one, the serum acting correctly, the case may then be cured. If, however, the case cannot exist without the presence of the tube, I immediately reintubate. I then permit the tube to remain undisturbed for four days more, and then attempt removal. Should there be the slightest symptom of suffocation, my tube remains until no longer required, be the time a day, week or month. If the tube remains longer than the second extubation I dignify the case with the title of a prolonged intubation. Then I begin to intubate and extubate with progressively smaller tubes until the case no longer requires them. Meanwhile, I never forsake the strychnia, and continue its use, in progressively larger doses. until I have obtained a satisfactory result.

INTRAMUSCULAR BENZATHENE PENICILLIN IN THE PROPHYLAXIS OF STREPTOCOCCAL INFECTION IN RHEUMATIC CHILDREN. (Brit. M.J., 2:729-730, Sept. 25, 1954). Monthly intramuscular injections of benzathene penicillin in doses of 1.5 mega units produced prophylactic blood levels of penicillin in the majority of 22 children recovering from acute rheumatism or chorea. These injections gave rise to some local tenderness for 24 hours and in some cases slight fever. The injections eliminated group A hemolytic streptococci from the throats of carriers and almost completely prevented new infections.—*J.A.M.A.*

DEPARTMENT OF ABSTRACTS

BLUNDELL, A.: Non-Fatal Case of Curling's Ulcer in a Child. (British Medical Journal, 4880:133, July 17, 1954).

A case of Curling's ulcer in a child aged 4 years with 25 per cent body surface burns is described. From the third day onwards for 6 weeks, severe attacks of melena and hematemesis occurred, during which time a total of 13½ pints (7.7 litres) of blood were given. After two grafting operations, with resultant healing of the burns, the ulcer symptoms subsided and the child improved rapidly. The prognosis in cases of Curling's ulcer is poor, especially in children, death occurring most often from hemorrhage or perforation. This case illustrates that if conservative treatment of the ulcer and its complications can be maintained until the burns have healed, then the ulcer will heal spontaneously.

AUTHORS' SUMMARY.

LUONGO, M. A. AND BJORNSON, S. S.: THE LIVER IN FERROUS SULPHATE POISONING. A Report of Three Fatal Cases in Children and an Experimental Study. (New England Journal of Medicine, 251:995, Dec. 16, 1954.)

Three fatal cases of accidental ingestion of medicinal ferrous sulphate preparations in children are presented. In all three cases and in rabbits the most important anatomic change produced by toxic doses was in the liver. Characteristically, hemorrhagic necrosis of the peripheral or periportal portions of the liver lobules was noted both in the patients and in the animals given appropriately large doses. These lesions appeared in rabbits receiving amounts of iron sufficiently great to cause death in approximately half the animals subjected to the dosage (1 gm./Kgm. of body weight). Larger amounts in nearly all animals caused death before sufficient time elapsed for the development of zonal necrosis and subsequent pathologic change. In the rabbit, survival of the administration of even one massive dose resulted in healing of the damaged periportal areas, with a diffuse hepatic fibrosis sufficiently pronounced to be termed a minimal cirrhosis.

AUTHORS' SUMMARY.

BURNS, E.; PRATT, A. M. AND HENDON, R. G.: MANAGEMENT OF BLADDER NECK OBSTRUCTION IN CHILDREN. (Journal American Medical Association, 157:570, Feb. 12, 1955.)

The management of bladder neck obstruction in children is fundamentally the same as in adults. The types of obstruction encountered include contracture of the internal vesicle orifice, congenital prostatic valves, and, rarely, hypertrophy of the Colliculus seminalis. Early recognition of bladder neck obstruction is imperative, for in the early stages cure can be obtained by surgical removal; if the condition is left uncorrected irreversible renal damage is inevitable. Complete study of the urinary tract is important in evaluation of the pathological changes that have occurred in the urinary tract above the obstruction. This includes chemical and bacteriological urinalysis, evaluation of the renal function, urography, and cystourethroscopy. Treatment is surgical removal of the obstruction by a modified retropubic approach or by transurethral resection supplemented by measures to correct secondary complications. AUTHORS' SUMMARY.

BLOOD LEVEL OF BASAL PYRUVIC ACID IN POLIOMYELITIS. (Minerva pediat., 6:409-411, June 15, 1954). The authors studied the blood pyruvic acid levels in 25 children with poliomyelitis. The patients were kept fasting and at rest before the tests were made. The first determination was made soon after admission and early after the onset of paralysis. The results showed that the blood pyruvic acid value was almost normal at the onset of the disease and changed only slightly during the first 20 days. The constant and characteristic finding was a decrease, in 18 patients, of the values that were found with the third measurement as compared with those found with the second. The number of patients studied is too small to permit a definitive statement. The authors suggest that the fact that the pyruvic acid levels in the blood did not increase during the acute phase of the disease may be ascribed to an increased storage of this acid in the paralyzed muscles. The decrease that was found in the third measurement as compared to the values obtained in the second may be due to a gradual attenuation of the acute disease while the action of the paralysis on the pyruvic acid in the involved muscles was still present.—*J.A.M.A.*

BOOK REVIEWS

Cystic Fibrosis of the Pancreas in Infants and Children. By Charles D. May, M.D. Flexible cloth. Pp. 93. Illustrated. Springfield, Ill.: Charles C. Thomas, 1954.

This monograph on cystic fibrosis of the pancreas is concise but nonetheless a complete presentation of the subject. The brief chapter on the pathological physiology involved is most lucid and gives one a better understanding of the clinical manifestations. The last chapter on the cause and pathogenesis of the disease might have been better placed before the chapter on clinical manifestations. The bibliography of five pages would be of interest for those who would desire more complete information. The book is easily readable and highly recommended. Michael A. Brescia, M.D.

Improving the Child's Speech. By Virgil A. Anderson. Cloth. Pp. 333. Illustrated. Price $5.50. New York: Oxford University Press, 1953.

A child with a speech defect is as much a handicapped child as one with any other kind of organic defect. Social relationships are so dependent on adequate speech that any deficiency becomes a real handicap, which can easily lead to serious consequences. This book is intended for teachers. However, the book can certainly be read with profit by physicians who handle many children so that they might have a better understanding of speech defects and might be a help in giving proper recommendations to the teacher of the patient who might have a speech defect. The author stresses a good point when she recommends that every teacher, regardless of the subject she might be teaching, be also aware of speech defects and attempt to correct by direct or indirect approach, depending on the particular problem. Speech teachers and more specialized instructions should only be necessary in some of the more difficult speech problems.

Michael A. Brescia, M.D.

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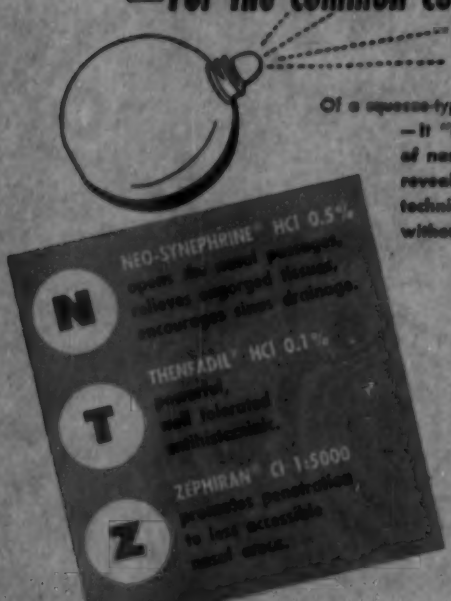

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1. Silbert, N. E.: GP, 8:55, Dec., 1953.